Arousal loss associated with safer sex and risk of pregnancy: Implications for women's and men's sexual health.

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Abstract:

CONTEXT: Few studies have examined arousal loss associated with safer-sex practices or the perceived risk of unintended pregnancy, let alone its associations with sexual risk practices.

METHODS: An Internet survey conducted in 2004–2006 among 2,399 men and 3,210 women asked respondents about arousal loss related to the use of condoms or other safer-sex products and perceived unintended pregnancy risk. Regression analyses gauged associations between arousal profiles, unprotected sex in the last year and lifetime experience of unintended pregnancy.

RESULTS: Many respondents reported arousal loss related to the use of safer-sex products (34%) or the risk of unintended pregnancy (46%). Participants who strongly agreed that use of safer-sex products can lessen their arousal were significantly more likely to have had unprotected sex in the last year than were those who strongly disagreed (odds ratios, 1.8 for men and 3.7 for women); those who strongly disagreed that pregnancy risk can lessen their arousal were significantly more likely to have been involved in an unintended pregnancy than were those who strongly agreed (2.0 for men and 1.4 for women). Arousal loss related to safer-sex practices was more strongly associated with unprotected sex among women than among men, whereas arousal loss related to pregnancy risk was more strongly associated with unintended pregnancy among men than among women.

CONCLUSIONS: Some men and women are turned off by safer-sex practices or by pregnancy risk. Given arousal profiles' potential contributions to unintended pregnancies and STD transmission, they should be integrated into sexual health behavioral models, research and programming.

Keywords: arousal | sexual behavior | sexual health | safer sex | contraceptives | reproductive health

Article:

Although men's and women's reasons for participating in sexual activities are complex, sexual enjoyment is a primary motive.1–3 Research with men has illustrated that sexual pleasure influences sexual behaviors such as condom use.4–7 Investigations of women's sexual behaviors have given less attention to the influence of sexual pleasure and arousal, instead focusing on the premise that women's motivations may have more to do with the wish for intimacy, expressions of love, relationship maintenance, a desire to please their male partners or economic need.8–10 However, more recent scholarship proposes that women are active seekers of sex that is pleasurable, enjoyable and comfortable, leading them to prefer methods of pregnancy and disease prevention that allow for maximum sexual enjoyment and minimum sexual discomfort and interruption.11,12

Sexual arousal, which also influences sexual behavior, can be shaped by mood and concerns about pregnancy and STDs.13,14 For some individuals, a negative mood (e.g., anxiety or depression) may decrease sexual desire and arousal; for others, a negative mood may have a positive effect on sexual arousal and increase the likelihood of engaging in higher risk sexual behaviors.15 Concerns about pregnancy and STDs can undermine sexual arousal for some, but safer-sex practices, such as contraceptive use or discussing STD histories with a partner, can undermine arousal for others.13 Condoms (both male and female) are the most effective means of preventing both pregnancy and STDs. However, some men and women may choose not to use condoms because they reduce sexual pleasure or arousal.16,17

With discouraging rates of unintended pregnancy18 as well as STDs such as HIV and syphilis in the United States,19,20 it is essential to understand what factors contribute to sexual risk and protective behaviors. Sexual pleasure and arousal may critically influence both men's and women's willingness to use contraceptive and disease prevention methods. Although we may assume that the risk of unintended pregnancy can undermine arousal and bolster protective practices, few studies have collected data on this issue. Data on the influence of perceived pregnancy risk on arousal and sexual behavior are especially lacking for men, who are assumed to be comparatively unaffected by pregnancy-related arousal issues, given that the social and financial burden of unintended childbearing often falls to women. Further, even as condom promotion and other safer-sex programs remain an integral component of the sexual health field,

these programs have given little attention to the potential of sexual pleasure and arousal in shaping both risk and preventive behaviors, especially for women.2,21 An approach that is sensitive to both pleasure and arousal profiles may facilitate a better understanding of the ways in which people make decisions that affect their sexual health.

In the spirit of such an approach, this study explored arousal loss related to the use of safer-sex products and the perceived risk of unintended pregnancy for both women and men, and the associations between these arousal profiles and sexual behaviors. Using a large, Internet-based survey of women's and men's sexual behaviors, we posed three research questions: How is sexual arousal affected by the use of safer-sex products, such as condoms, and the perceived risk of pregnancy? To what extent are these arousal variables associated with sexual risk behaviors and history (namely, unprotected sex and unintended pregnancy)? Finally, do gender differences exist in arousal patterns or their associations with risk behaviors?

METHODS

Procedures and Participants

To explore our research questions, we used data from a larger project, conducted at The Kinsey Institute at Indiana University, on the role of mood and sexual arousal in sexual decision making and risk-taking. This project builds upon research on the role of personality traits in sex, including the propensity for sexual inhibition and excitation, as well as the association between negative mood and increased sexual interest and risk-taking.22,23 Study protocols were approved by the Indiana University Institutional Review Board, and data were collected between January 2004 and April 2006.

The larger sample included three groups: Indiana University psychology students; men and women from the local community of Bloomington; and men and women from outside of Bloomington, who took the survey electronically by means of the Kinsey Institute Web site. The analysis we describe here focuses on the online respondents, who represent the most diverse of the samples, both geographically and demographically, and whose patterns of sexual behaviors and outcomes most closely resemble national patterns.24 Some online respondents were self-referred when they visited the Web site, but most were recruited through research announcements in Kinsey Institute newsletters, media releases and word of mouth. Online recruitment methods have been commonplace in fields such as psychology and sexuality studies, in which internal validity can be of greater value than generalizability.25 Studies of sexual

behavior in particular have benefited from Internet-based methods, given that respondents may be more willing to answer sensitive questions online than they would be in face-to-face interviews.26–28

The anonymity of the online study meant that the data were free of identifying information—a fact made explicit to respondents on introductory Web pages as a way of improving data validity. Participants were presented with an informed consent statement; they needed to click to indicate their agreement to participate and to proceed to the survey. Interested participants were also asked to confirm that they were 18 or older before proceeding. Completion of the survey took approximately 45–50 minutes. Sections included a demographic and sexual history questionnaire; the Mood and Sexuality Questionnaire;29 the Sexual Inhibition/Sexual Excitation Scale;23 questions about sexual activity and condom use; and inventories related to depression, anxiety and subjective mood. No financial remuneration was offered, which strongly discouraged duplicate entries. Of the thousands of respondents who began the survey by consenting to participate, 78% completed all parts to which they were directed.

Several efforts were made to ensure the validity of the data throughout the data collection and cleaning process. For example, investigators looked for repetitive response patterns and inconsistencies in answers to questions about age, gender, relationship status and sexual orientation. In addition, data were reviewed to ensure no multiple entries. Cases of duplicate identification numbers (due to a respondent's submitting the first page and then returning to it later) were deleted.

We first limited our sample to the 20,759 online respondents. We further restricted it to the 14,284 of these men and women who were currently living in the United States or in Canada, to confine our exploration to individuals living in societies with similar cultural norms regarding sexuality, safer sex and pregnancy.

Respondents who provided no information on age (1,236 individuals), gender (929) or sexual orientation (1,330) were excluded. (These groups overlapped somewhat—for example, some respondents failed to indicate both their gender and their age.) Respondents who were younger than 18 (62 participants) or older than 80 (11, most of whom reported extreme ages, such as 300) were excluded as well.

The depression, anxiety and mood inventories were administered only to the 9,381 respondents who indicated that they had been heterosexually active in the past year. Given our interest in unintended pregnancy, we limited analyses to the 6,285 participants who had been heterosexually active and who completed all parts of the questionnaire.

We excluded respondents who indicated that they had tried to conceive in the past year (589), were unsure whether they had been trying to conceive (33) or had missing responses for this question (54). Our final sample of 5,609 respondents (2,399 men and 3,210 women) included only those who clearly stated that they had not tried to conceive in the last 12 months.

Measures

•Arousal variables.

We included two arousal items from the Sexual Inhibition/Sexual Excitation Scale, each of which contained four possible responses: strongly agree, agree, disagree and strongly disagree. The first assessed arousal loss related to the use of condoms and other safer-sex products. Men were asked to respond to the statement “Putting on a condom can cause me to lose my erection”; women were prompted with “Using condoms or other safe sex products can cause me to lose my arousal.” The second item assessed arousal loss related to unintended pregnancy. Both women and men were prompted with the statement “If there is a risk of unwanted pregnancy, I am unlikely to get sexually aroused.”

•Dichotomous sexual behavior variables.

Respondents were classified as having had unprotected sex in the last 12 months if they answered yes to the following question: “In the past 12 months, have you ever had unprotected vaginal intercourse (e.g., penis in the vagina without a condom or any other type of contraception or barrier)?” Their involvement in unintended pregnancy was assessed through the question “During your lifetime, have you become unintentionally pregnant?” or “During your lifetime, have you gotten someone unintentionally pregnant?” Participants were classified as having been involved in at least one unintended pregnancy if they answered “yes, once” or “yes, two times or more.” Respondents were classified as having a history of STD if they indicated they had ever tested positive for at least one of the following: genital herpes, human papillomavirus or genital warts, hepatitis B, gonorrhea, syphilis, chlamydia, nonspecific urethritis or HIV.

•Covariates.

The survey collected demographic information that allowed us to control for certain variables known to be associated with sexual behaviors. These included age, relationship type ("exclusive, monogamous"; "nonexclusive, nonmonogamous"; or none), relationship length (in number of years and months), and employment status (full-time; part-time; unemployed; or temporary or seasonal worker). We also included self-reported level of income. Respondents chose one of six options (poverty level, lower income, lower middle, middle, upper middle, upper), which we combined into four groups: poor, lower income, middle income and upper income.

Analyses

To explore gender differences in the sexuality variables, we compared men and women with respect to arousal and sexual behaviors using chi-square and t tests.

We then used multiple logistic regression to explore whether arousal loss related to safer sex was associated with unprotected sex in the last 12 months, and whether pregnancy-related arousal loss was associated with experience of unintended pregnancy. In both models, we controlled for all of the covariates. In the first model, we also controlled for STD history, which tends to be associated with condom use and other safer-sex practices. We treated the arousal variables as categorical, since their relationships with the sexual outcome variables were not sufficiently linear to justify treating them as continuous. (We reran the models with the arousal variables as continuous, and the results were nearly identical. However, we report only results from the categorical analyses.)

RESULTS

Sample Characteristics

Participants were largely young (mean age, 30), but on average, men were slightly older than women (35 vs. 28 years; p=.000). Ninety-one percent were white (Table 1). The majority were employed either full-time (52%) or part-time (24%), although a greater proportion of men than of women were employed full-time (65% vs. 43%). A substantial proportion of respondents (43%) were students and said they were attending college, technical school or university (not shown). The majority reported incomes in the middle two ranges (72%), whereas 5% identified as poor and 22% as upper income. However, women were more likely than men to be in the lowest income category (6% vs. 4%), and men were more likely than women to report upper income status (28% vs. 18%).

Table 1. Percentage distribution of respondents to an Internet survey on sexual arousal and behaviors, by selected characteristics, 2004–2006

Characteristic	All (N=5,609)	Men (N=2,399)	Women (N=3,210)
DEMOGRAPHIC			
Race			
White	90.6	92.8	88.5
Nonwhite	9.6	7.2	11.5
Employment status[***]			
Employed full-time	52.4	65.3	42.8
Employed part-time	23.7	15.7	29.7
Unemployed	19.6	15.1	22.9
Temporary/seasonal worker	4.3	3.9	4.6
Level of income[***]			
Poor	5.3	4.1	6.2
Low income	39.1	32.0	44.5
Middle income	33.2	35.7	31.3
Upper income	22.4	28.1	18.1
Relationship type[*]			
Exclusive, monogamous	67.5	69.4	66.1
Nonexclusive, nonmonogamous	16.7	16.3	17.0
None	15.8	14.3	17.0

Characteristic	All (N=5,609)	Men (N=2,399)	Women (N=3,210)
Relationship length[***]			
Not in a relationship	16.5	15.3	17.3
<6 months	10.9	7.8	13.1
≥6 to <12 months	8.4	6.7	9.6
≥1 year to <3 years	18.6	14.4	21.7
≥3 years	45.7	55.8	38.3
SEXUAL HISTORY			
Ever had an STD[***]			
No	78.2	82.3	75.1
Yes	21.8	17.7	24.9
Ever involved in an unintended pregnancy[**]			
No/unsure	68.9	71.1	67.2
Yes	31.1	28.8	32.8
Use/partner uses hormonal contraceptive[***]			
Yes	38.6	34.1	41.7
No/unsure	61.4	65.9	58.3
Had unprotected sex in the last 12 months[***]			
Yes	68.9	73.9	65.2
No/unsure	31.1	26.1	34.8
AROUSAL			
Use of condoms/other safer-sex products leads to loss of arousal			

Characteristic	All (N=5,609)	Men (N=2,399)	Women (N=3,210)
Strongly agree	7.5	9.8	5.8
Agree	26.3	29.8	23.6
Disagree	45.5	43.6	46.9
Strongly disagree	20.8	16.8	23.7
Risk of unwanted pregnancy leads to loss of arousal* **			
Strongly agree	15.3	9.3	19.8
Agree	30.9	28.0	33.1
Disagree	41.6	48.5	36.4
Strongly disagree	12.2	14.2	10.7
Total	100.0	100.0	100.0

*p <.05 . **p <.01 . ***p <.001.

Some 68% of respondents were in monogamous relationships, 17% were in nonmonogamous relationships and 16% were not in a relationship at the time of the study. Relationship length ranged from zero to 54 years and averaged six years (not shown). A greater proportion of women than of men were in relationships of less than six months' duration (13% vs. 8%), and a lower proportion had been in relationships for three years or longer (38% vs. 56%).

Overall, 22% of respondents had had at least one STD; the proportion was significantly higher among women than among men (25% vs. 18%). Thirty-one percent (including 33% of women and 29% of men) had been involved in at least one unintended pregnancy.

Slightly more than a third of respondents were currently using (or had partners who were currently using) hormonal contraceptives. Not surprisingly, since women are the ones who take these methods, women were significantly more likely than men to report use (42% vs. 34%).

A large proportion of respondents (69%) reported having engaged in unprotected sex during the last 12 months; men were significantly more likely than women to report this behavior (74% vs. 65%).

Overall, 34% of respondents reported that using safer-sex products can cause them to lose their arousal; 46% reported that the risk of unintended pregnancy had this effect. As expected, significant gender differences marked these variables. Whereas 40% of men agreed or strongly agreed that using condoms can cause them to lose their arousal, 29% of women agreed or strongly agreed that using safer-sex products can cause them to lose their arousal. Substantial proportions of both men and women reported that pregnancy risk lessened their arousal. Nevertheless, the proportions agreeing or strongly agreeing with this statement differed by gender—37% of men and 53% of women.

Safer Sex–Related Arousal Loss and Unprotected Sex

•Men.

Almost three in four men (73%) said they had had unprotected sex in the last 12 months; however, this proportion differed by reports of condom-related arousal loss. Some 71% of men who strongly disagreed that condoms can diminish their arousal had had unprotected sex in the last 12 months, compared with 82% of those who strongly agreed (p=.007).

In analyses controlling for covariates (Table 2), men who strongly agreed that condoms diminish their arousal were significantly more likely than men who strongly disagreed to have had unprotected sex in the last 12 months (odds ratio, 1.8). Reports of agreement and disagreement were not associated with the likelihood of unprotected sex.

Table 2. Odds ratios from logistic regression analyses assessing the likelihood that men and women who reported arousal loss related to use of condoms or other safer-sex products had unprotected sex in the last 12 months

Characteristic	Men	Women
Use of condoms /other safer-sex products leads to loss of arousal		
Strongly agree	1.79**	3.66***
Agree	1.08	2.58***
Disagree	0.97	1.42***
Strongly disagree (ref)	1.00	1.00
Relationship type		
None (ref)	1.00	1.00
Exclusive, monogamous	1.30	1.39
Nonexclusive, nonmonogamous	2.32	2.29**
Ever had an STD		
No (ref)	1.00	1.00
Yes	1.36*	1.64***
Age	1.02***	1.04***
Relationship length		
Not in a relationship (ref)	1.00	1.00
<6 months	0.88	0.95
≥6 to <12 months	1.08	1.18
≥1 year to <3 years	1.03	0.87
≥3 years	1.33	0.87

Characteristic	Men	Women
Current level of income		
Poor	1.11	1.39
Lower income	1.25	1.46*
Middle income	1.06	1.24*
Upper income (ref)	1.00	1.00
Employment status		
Employed full-time	1.50	1.54
Employed part-time	1.40	1.46
Unemployed	1.24	1.92
Temporary/seasonal worker (ref)	1.00	1.00
Nagelkerke R^2	*0.07***	*0.12****

*p <.05 . **p <.01 . ***p <.001. *Note:* ref=reference group.

•Women.

Arousal loss related to safer sex was more strongly linked to unprotected sex among women than it was among men. Among women who strongly disagreed that safer-sex products can diminish their arousal, 53% had had unprotected sex in the last 12 months (not shown). Among those who strongly agreed, the proportion was 78% (p=.000). This difference of 25 percentage points is more than twice the difference between these two categories among men.

Arousal loss related to safer sex remained strongly associated with unprotected sex for women even when covariates were controlled for (Table 2). Compared with women who strongly disagreed that safer-sex products undermine their arousal, women who strongly agreed and those who agreed were significantly more likely to have had unprotected sex in the last 12 months (odds ratios, 3.7 and 2.6, respectively).

Pregnancy-Related Arousal Loss and Unintended Pregnancy

•Men.

Overall, 29% of men reported that they had been involved in at least one unintended pregnancy. The proportion was significantly lower among men who strongly agreed that risk of unwanted pregnancy can diminish their arousal (21%) than among those who strongly disagreed (33%).

In multivariate analyses (Table 3), pregnancy-related arousal loss remained associated with unintended pregnancy experience. The odds of reporting involvement in an unintended pregnancy were about twice as high among men who disagreed or strongly disagreed that pregnancy risk diminishes arousal as among those who strongly agreed (odds ratios, 1.8 and 2.0, respectively).

Table 3. Odds ratios from logistic regression analyses assessing the likelihood that men and women who reported arousal loss related to perception of pregnancy risk had been involved in an unintended pregnancy

Characteristic	**Men**	**Women**
Risk of unwanted pregnancy leads to loss of arousal		
Strongly agree (ref)	1.00	1.00
Agree	1.00	1.04
Disagree	1.75**	1.33*
Strongly disagree	2.00**	1.42*
Relationship type		
None (ref)	1.00	1.00
Exclusive, monogamous	1.04	3.69*
Nonexclusive, nonmonogamous	1.64	4.64**
Age	1.04***	1.08***
Relationship length		

Characteristic	Men	Women
Not in a relationship (ref)	1.00	1.00
<6 months	1.21	0.41
≥6 to <12 months	1.27	0.43
≥1 year to <3 years	1.23	0.42
≥3 years	2.09	0.62
Current level of income		
Poor	1.36	2.22***
Lower income	1.27	1.63***
Middle income	1.05	1.33*
Upper income (ref)	1.00	1.00
Employment status		
Employed full-time	1.12	1.74
Employed part-time	0.74	1.30
Unemployed	0.94	1.63
Temporary/seasonal worker (ref)	1.00	1.00
Nagelkerke R^2	*0.14***	*0.22***

*p<.05 . **p <.01 . ***p <.001. Note: ref=reference group.

•Women.

Similarly, women's likelihood of having had an unintended pregnancy varied by reports of pregnancy--related arousal loss. Twenty-seven percent of women who strongly agreed that risk of unwanted pregnancy can diminish arousal had experienced an unintended pregnancy, compared with 40% of women who strongly disagreed (p=.000—not shown).

Notably, in multivariate analyses (Table 3), pregnancy-related arousal loss was not as strongly related to women's reports of unintended pregnancy as it was to men's. Compared with women who strongly agreed that pregnancy risk diminishes arousal, women who disagreed or strongly disagreed had a greater likelihood of having experienced an unintended pregnancy (odds ratios, 1.3 and 1.4, respectively).

DISCUSSION

Pleasure reduction has been identified as an important reason for not using condoms.17,30 However, with few exceptions,2,31,32 sexual health research has ignored the impact of pleasure and arousal on sexual risk and risk reduction practices, particularly for women. This exploratory study suggests that safer-sex practices such as condom use and the perceived risk of unintended pregnancy can undermine sexual arousal and enjoyment for substantial proportions of men and women. What is more, both arousal loss related to safer-sex practices and arousal loss related to pregnancy risk appear strongly related to sexual health outcomes, even when age, relationship type and other covariates are taken into account. These findings contradict some relatively common gender-based assumptions in the field of sexual and reproductive health. They also carry implications for efforts aimed at sexual risk reduction.

Nearly one in three women in this study reported decreased arousal due to safer-sex practices such as condom use. Although the proportion was significantly higher among men, arousal loss related to the practice of safer sex was much more strongly associated with unprotected sex in the last 12 months for women than for men. Researchers have associated men's lack of condom use with reductions in sexual pleasure and arousal, but they have been slower to recognize that safer-sex products also affect sexual sensation or arousal among women, potentially decreasing the likelihood of condom use. For example, in a formative analysis of condom use, men's reports of reduction in pleasure were emphasized, while women's were not, even though a substantial proportion of women reported reduced pleasure.17 Our findings add to this analysis by emphasizing not only that women experience condom-associated arousal loss, but also that arousal loss may undermine condom use more among women than among men.

It could be that women in this study reported condom-associated arousal loss at least in part because they fear that condoms undermine their male partner's enjoyment of sex as well as their own. Some previous research suggests that although women want to enjoy sex, at times their erotic fulfillment depends on their pleasing their partners—in some cases, by encouraging

unprotected sex.33 In one study, women's concern for their partner's pleasure was a primary determinant of condom use.31 Although our data did not capture respondents' thoughts about their partner's condom preferences, future work on condoms and sexuality should try to assess both domains.

Our findings also point to limitations of standard condom promotion programs among heterosexual women and men. Whereas health campaigns geared to individuals who have same-sex partners emphasize a range of possible (and lower risk) sex acts, campaigns aimed at those who have only partners of the opposite sex have not challenged the dominant script, in which "sex" equates to vaginal intercourse.34 Nor have they promoted pleasure as a means to increase protective behaviors.2,30 Our findings suggest that condom promotion programs have to better address the needs of both women and men who experience condom-related arousal loss, helping them devise better strategies to avoid STDs and unintended pregnancy. We need to learn how to identify and understand individuals who find their arousal affected by different kinds of risk, and to devise risk reduction options for those strongly averse to condoms.

The findings presented here also challenge some commonly held notions regarding men and unintended pregnancy. As expected, in univariate analyses, women's arousal was more likely than men's to be compromised by the perceived risk of unintended pregnancy. However, not only did 29% of men report involvement in an unintended pregnancy, more than one in three men reported that their arousal was undermined by the perceived risk of unintended pregnancy. More importantly, pregnancy-related arousal loss seemed more strongly associated with men's perceived risk of unintended pregnancy than with women's. Few studies have surveyed men about unintended pregnancy,35,36 in part because researchers assume that men do not know about, or will underestimate, unintended pregnancies. Even fewer studies have attempted to measure how men's arousal may be affected by the idea of pregnancy and how any such effects may influence their use of contraceptives and STD prevention methods,37 but such work is beginning to appear in the literature.38 Our results suggest that pregnancy prevention is a salient goal for many men, and pregnancy risk influences how fully some men are able to become aroused and enjoy sex. Men whose arousal is diminished by perceived pregnancy risk may hold the key to our efforts to prevent unintended pregnancies and promote effective contraceptive use.

Men whose arousal is diminished by perceived pregnancy risk may hold the key to our efforts to prevent unintended pregnancies.

Limitations

Our study has a number of limitations, the first of which is the measurement of our safer-sex variable. Men were asked specifically about erection loss related to condoms, but women were asked about arousal loss related to condoms and other safer-sex products. Because of the latter phrasing, we cannot be certain about what product or practice women had in mind when responding to this question, and women may have given different responses for different methods. Thus, for example, a woman who felt that condoms decrease her arousal, but that spermicide does not, could have been unsure as to whether to agree or disagree with the statement; and some women could have thought of oral contraceptives or other methods that are not effective for STD prevention when responding. However, in both academic and common parlance, "safer sex" increasingly means STD prevention, rather than pregnancy prevention—and therefore condoms, rather than other contraceptives.39 Nonetheless, the imprecisely worded prompt detracts from the precision of our analysis and precludes any definitive conclusions about women and arousal loss related to condom use—hence our use of the more ambiguous phrase "arousal loss related to safer sex." Given that arousal related to the practice of safer sex seemed to be strongly associated with unprotected sex among women, we hope this analysis will inspire future research in which condom-related arousal is measured more precisely.

We also note that despite the association between arousal and sexual risk behaviors, this analysis has not accounted for many other factors that more strongly influence risk-related practices. The majority of both men and women disagreed or strongly disagreed that engaging in safer sex causes them to lose their arousal, yet the majority also had engaged in unprotected sex in the past 12 months. Thus, there are many other factors related to unprotected sex not assessed in this study. Since men were more likely than women overall to engage in unprotected sex, regardless of how condoms shaped their arousal, the association between condom-related arousal loss and unprotected sex was bound to be smaller for them.

Our study is also limited by our use of an Internet-based convenience sample. Despite increasing evidence that online questionnaires can produce higher quality and less biased data than once believed,40,41 our sample captures a select group of individuals, who may have been unusual in their willingness to spend 45–50 minutes answering questions about sexuality for no monetary compensation. (The sample also was 91% white, which further limits the study's generalizability.) Yet, using an online format to collect data on sexuality can also enhance data validity, since respondents feel assured of their privacy and anonymity.26,27 Online samples have been extremely useful for generating hypotheses about understudied sexual topics.26,27 Nonetheless, future studies of this topic should involve more diverse and representative samples,

including both older and younger individuals from a broader range of racial and ethnic backgrounds.

Reported levels of some key behaviors and outcomes were higher in our sample than they are nationwide (e.g., 18% of men in our sample had had at least one STD, compared with 7% of men nationwide24); but for other indicators, the reverse was true (e.g., 33% of women in our sample, compared with 49% in a national data set,18 had had an unintended pregnancy). However, the data are not strictly comparable because of sampling differences. Whereas our survey interviewed adults 18 and older, both national data sets cited here limited their samples to 15–44-year-olds. Even though our sample may have captured a group of people who are particularly willing to engage in potentially risky sexual behaviors, and thus are of particular interest to researchers and practitioners, it will be very important to explore arousal profiles and their associations with sexual risk using nationally representative data.

Conclusion

The main goal of our study was not to make definitive claims about the prevalence of arousal loss or about associations between arousal and sexual risk. Rather, we wanted to generate and explore hypotheses about some of these associations, and the role of gender in those associations. We also hoped to add to the sparse literature on both women's sexual experience with safer-sex practices and men's sexual experience vis-à-vis pregnancy risk. For these purposes, the sample and survey served us well despite their limitations.

Our findings demonstrate that arousal profiles may be a small but important part of the framework explaining sexual behaviors and risk-taking. Some people are clearly turned off by risk, while others are turned off by safer-sex practices. Therefore, sexuality and arousal profiles should be taken seriously in behavioral models of risky sex. These profiles could contribute an essential element to effective collaboration with clients on improving sexual health outcomes. We also highlight the continued importance of recognizing women's sexual arousal and pleasure and their effects on effective prophylaxis. Finally, we argue that men need to be involved in sexual health promotion—for themselves, for their partners, and for the reduction of both unintended pregnancy and STDs.

REFERENCES

Meston CM and Buss DM, Why humans have sex, Archives of Sexual Behavior, 2007, 36(4):477–507.

Philpott A, Knerr W and Maher D, Promoting protection and pleasure: amplifying the effectiveness of barriers against sexually transmitted infections and pregnancy, Lancet, 2006, 368(9551):2028–2031.

Pinkerton SDet al., The pleasures of sex: an empirical investigation, Cognition and Emotion, 2003, 17(2):341–353.

Carballo-Dieguez A and Bauermeister J, “Barebacking”: intentional condomless anal sex in HIV-risk contexts—reasons for and against it, Journal of Homosexuality, 2004, 47(1):1–16.

Khan SIet al., Safer sex or pleasurable sex\quest rethinking condom use in the AIDS era, Sexual Health, 2004, 1(4):217–225.

Choi KH, Rickman R and Catania JA, What heterosexual adults believe about condoms, New England Journal of Medicine, 1994, 331(6):406–407.

Conley TD and Collins BE, Differences between condom users and condom nonusers in their multidimensional condom attitudes, Journal of Applied Social Psychology, 2005, 35(3):603–620.

Hirsch JSet al., Social constructions of sexuality: the meanings of marital infidelity and STD/HIV risk in a Mexican migrant community, American Journal of Public Health, 2002, 92(8):1227–1237.

Cooper MLet al., Personality and the predisposition to engage in risky or problem behaviors during adolescence, Journal of Personality and Social Psychology, 2003, 84(2):390–410.

Carpenter LM, Gender and the meaning and experience of virginity loss in the contemporary United States, Gender & Society, 2002, 16(3):345–365.

Higgins JA and Hirsch JS, Pleasure, power, and inequality: incorporating sexuality into research on contraceptive use and unintended pregnancy, American Journal of Public Health, 2008, 98(10):1803–1813.

Tanner AEet al., Young women's use of a microbicide surrogate: the role of individual and contextual factors in acceptability and sexual pleasure, Journal of Sex Research, 2009, 46(1):15–23.

Graham CAet al., Turning on and turning off: a focus group study of the factors that affect women's sexual arousal, Archives of Sexual Behavior, 2004, 33(6):527–538.

Janssen Eet al., Factors that influence sexual arousal in men: a focus group study, Archives of Sexual Behavior, 2008, 37(2):252–265.

Bancroft Jet al., Sexual activity and risk taking in young heterosexual men: the relevance of sexual arousability, mood, and sensation seeking, Journal of Sex Research, 2004, 41(2):181–192.

Yarber WLet al., “Do you know what you're doing\quest” College students' experiences with condoms, American Journal of Health Education, 2007, 38(6):322–331.

Randolph MEet al., Sexual pleasure and condom use, Archives of Sexual Behavior, 2007, 36(6):844–848.

Finer LB and Henshaw SK, Disparities in rates of unintended pregnancy in the United States, 1994 and 2001, Perspectives on Sexual and Reproductive Health, 2006, 38(2):90–96.

Centers for Disease Control and Prevention, HIV/AIDS in the United States, http://www.cdc.gov/hiv/resources/factsheets/PDF/us.pdf, Atlanta: Centers for Disease Control and Prevention, 2008, accessed Oct. 22, 2008.

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, 2006 Disease Profile, Atlanta: Centers for Disease Control and Prevention, 2008.

Higgins JA and Hirsch JS, The pleasure deficit: revisiting the “sexuality connection” in reproductive health, Perspectives on Sexual and Reproductive Health, 2007, 39(4):240–247.

Bancroft Jet al., Sexual activity and risk taking in young heterosexual men: the relevance of sexual arousability, mood, and sensation seeking, Journal of Sex Research, 2004, 41(2):181–192.

Janssen Eet al., The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. measuring sexual inhibition and excitation proneness in men, Journal of Sex Research, 2002, 39(2):114–126.

Mosher WD, Chandra A and Jones J, Sexual behavior and selected health measures: men and women ages 15–44 years of age, Advance Data from Vital and Health Statistics, 2004, No. 362.

Kraut Ret al., Psychological research online: report of Board of Scientific Affairs' Advisory Group on the Conduct of Research on the Internet, American Psychologist, 2004, 59(2):105–117.

Prause N and Graham CA, Asexuality: classification and characterization, Archives of Sexual Behavior, 2007, 36(3):341–356.

Carballo-Dieguez Aet al., Sexual negotiation, HIV-status disclosure, and sexual risk behavior among Latino men who use the Internet to seek sex with other men, Archives of Sexual Behavior, 2006, 35(4):473–481.

Carini RMet al., College student responses to Web and paper surveys: does mode matter\questResearch in Higher Education, 2003, 44(1):1–19.

Bancroft Jet al., Sexual risk-taking in gay men: the relevance of sexual arousability, mood, and sensation seeking, Archives of Sexual Behavior, 2003, 32(6):555–72.

Philpott A, Knerr W and Boydell V, Pleasure and prevention: when good sex is safer sex, Reproductive Health Matters, 2006, 14(28):23–31.

Higgins JA and Hirsch JS, Pleasure and power: incorporating sexuality and inequality into research on contraceptive use and unintended pregnancy, American Journal of Public Health, 2008, 98(10):1803–1813.

Sanders SAet al., A prospective study of the effects of oral contraceptives on sexuality and well-being and their relationship to discontinuation, Contraception, 2001, 64(1):51–58.

Holland Jet al., The Male in the Head: Young People, Heterosexuality and Power, London: Turfnell Press, 1998.

Gavey N, McPhillips K and Braun V, Interruptus coitus: heterosexuals accounting for intercourse, Sexualities, 1999, 2(1):35–68.

Watkins SC, If all we knew about women was what we read in Demography, what would we know\questDemography, 1993, 30(4):551–577.

Greene ME and Biddlecom AE, Absent and problematic men: demographic accounts of male reproductive roles, Population & Development Review, 2000, 26(1):81–115.

Santelli Jet al., The measurement and meaning of unintended pregnancy, Perspectives on Sexual and Reproductive Health, 2003, 35(2):94–101.

Higgins JA, Hirsch JS and Trussell J, Pleasure, prophylaxis and procreation: a qualitative analysis of intermittent contraceptive use and unintended pregnancyPerspectives on Sexual and Reproductive Health, 2008, 40(3):130–137.

Wynn LL, Foster AM and Trussell J, Can I get pregnant from oral sex\quest sexual health misconceptions in emails to a reproductive health Website, Contraception, 200979(2):91–97.

Gosling SDet al., Should we trust Web-based studies\quest a comparative analysis of six preconceptions about Internet questionnaires, American Psychologist, 2004, 59(2):93–104.

Birnbaum MH, Human research and data collection via the Internet, Annual Review of Psychology, 2004, 55:803–832.